THE INSTITUTE REPORT

From the
VETERINARY VIRUS RESEARCH INSTITUTE
Cornell University, Ithaca, New York

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ANNUAL REPORT

CORNELL UNIVERSITY
VETERINARY VIRUS RESEARCH INSTITUTE
New York State Veterinary College
Ithaca, New York
1964

FOREWARD

- A Message From the Director -

This 1964 annual report of Cornell's Veterinary Virus Research Institute provides a review of the Institute's farm livestock program, its goals and accomplishments. It has been prepared especially for livestock owners and dealers, agricultural cooperative and business leaders, rural bankers, veterinarians, extension workers and others who have encouraged and supported the work. The growing list of financial contributors now numbers 278, over double the number of a year ago.

The accomplishments and results of the staff's investigations and field trials are outlined in the following pages. Marked progress has been made particularly, against the virus diseases of dairy cattle, beef cattle, and swine. Also, much new knowledge has emerged that when applied to herd management will bring improved animal health and correspondingly, higher incomes to dairymen and other livestock owners. The veterinary profession has assisted us greatly in our work.

As for the future, Cornell's investigators visualize vast opportunities to become of greater service to the livestock industries of New York State, the Northeast Region and the Nation. At present, the knowledge on the virus diseases of farm animals is very limited, but growing. For instance, mastitis, cattle breeding and sterility problems, winter dysentery, calf diseases, hog cholera and virus pneumonia of pigs are disturbing factors taking farm income toll. Livestock owners and practicing veterinarians are seeking more research help.

The staff at Cornell's Veterinary Virus Research Institute, given adequate funds, is in a position to provide this help. It has the scientific and technical knowledge, the laboratory equipment and the necessary test animals to intensify and enlarge the program. The dairy, meat and livestock industries are sure to benefit as this work at Cornell develops and grows.

In grateful appreciation and sincere thanks, we acknowledge the cooperation and support the Institute has received this year from those interested in the success of this program. During the year ahead, with livestock industry help, even more important accomplishments are foreseen.

James A. Baker
Institute Director

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The accomplishments and results of the staff's investigations and field trials are outlined in the following pages. Modified programs has been made particularly, against the virus diseases of dairy cattle, beef cattle, and swine. Also, much new knowledge has emerged that when applied to herd management will bring improved animal health and correspondingly, higher incomes to dairymen and other livestock owners. The veterinary profession has assisted me greatly in our work.

As for the future, Cornell's investigators visualize vast opportunities to increase of greater service to the livestock industries of New York State, the Northeast Region and the Nation. At present, the knowledge on the virus diseases of farm animals is very limited, not growing. For instance, mastitis, cattle breeding and sterility problems, viral pneumonia, calf diseases, fog choleras and virus pneumonia of pigs are disturbing factors taking large tolls annually. Livestock owners and practicing veterinarians are seeking more research help.

The staff at Cornell's Veterinary Virus Research Institute, given adequate funds, is in a position to provide this help. It has the scientific and material knowledge, the laboratory equipment and the necessary land animals to intensify and enlarge the program. The diary, meat and livestock industries are sure to benefit as this work as Cornell develops and grows.

In practical application and disease checks, we acknowledge the cooperation and support the Institute has received this year from those interested in the success of this program. During the year ahead, we invite Livestock Industry help, once more important accomplishments are foreseen.

James A. Baker
Institute Director

RESEARCH STAFF

Dr. James A. Baker	Director
Dr. Ben E. Sheffy	Associate Director
Dr. Leland E. Carmichael	Professor
Dr. John A. Roberts	Research Associate
Dr. Mohammed Taher Fouad	Research Assistant
Dr. Mehmet N. Guven	Research Assistant
Dr. Robert F. Kahrs	Research Assistant
Dr. Douglas S. Robson	Statistical Consultant
Dr. H. C. Stephenson	Consultant
Prof. Clarence G. Bradt	Consultant

Twenty additional people, including laboratory and animal technicians, office secretaries and maintenance employees complete the Institute's working staff.

WHAT IS THIS VIRUS INSTITUTE

The Cornell Veterinary Virus Research Institute is a livestock disease research center established in 1950 to carry on basic laboratory and field studies with virus agents and other living organisms causing animal diseases. The diseases of dairy cattle, beef cattle, horses and swine are under investigation. The veterinary profession, agricultural business groups and livestock owners are cooperating. Presently, the Institute has 278 cooperators and financial supporters.

INSTITUTE OBJECTIVES

1. Conduct basic research with virus agents and other living organisms responsible for livestock diseases.

2. Develop methods of disease prevention:
   (a) Discover new vaccines for farm animals.
   (b) Improve present vaccines.
   (c) Establish standards for uniformity of vaccines and for their use.

3. Make field studies of current farm animal disease problems and determine if vaccines economically, are desirable controls.

4. Render federal and state agencies aid in their efforts to keep farm livestock healthy.

5. Consult with industry and government research workers on the development, improvement and testing of biological materials for farm animal disease control.

6. Teach and train research workers.

7. Enlarge the incomes and profits of dairy and livestock farmers, and also of those selling livestock and its products, farm supplies and agricultural services.

8. Publish an annual report for distribution to institute supporters and collaborators.

MAJOR PROBLEMS UNDER ATTACK

1. Mastitis - Mastitis has been computed to cost the dairy industry in the United States $500,000,000, annually, and New York State $25-$30 million a year. This is a loss of about $20 a cow for each of the 1,400,000 dairy cows in this state.

2. Calf Diseases - Virus diseases kill many calves each year in dairy and beef herds. Thousands of others in New York and other states have their growth retarded and stunted.

3. Cowpox - A cattle virus disease of teats and udders highly infectious to the other cows in the herd, and to man. This problem can become serious and costly to dairy farmers.

4. Winter Dysentery - This is a cattle scorge, usually of late winter, reducing both milk production and the flesh condition of cows in dairy herds.

5. Hog Cholera - An intensive and costly experimental effort is being made to discover new and safer vaccines to protect pigs against this disease.

6. Infectious Bovine Rhinotracheitis (I.B.R.) - A respiratory disease of Western feedlot cattle, and a frequently undiagnosed disease of Northeast dairy cattle is under heavy attack by Institute investigators. Infectious pustular vulvovaginitis is caused by the same virus, I.B.R., Institute workers have learned.

7. Animal Nutrition - Experiments are in progress with test animals to determine if the production of virus disease antibodies is affected by feeds and feeding methods.

8. Dairy Cattle Breeding Troubles - Virus agents have been implicated as causes of abortions and breeding troubles in herds using both artificial and natural services. Many of these breeding failures, and early-term abortions are receiving intensive study and investigation.

ACCOMPLISHMENTS AND RESULTS

CATTLE

Field Studies on a Combined Vaccine

A long-term field trial of a combined vaccine for dairy cattle is being continued in nine dairy herds in the Ithaca area. One-third of the animals in these herds have been vaccinated with a combined vaccine containing Letospira pomona, bovine virus diarrhea, infectious bovine rhinotracheitis, bovine myxovirus parainfluenza 3 and an isolate of the pleuropneumonia-like group of organisms. The remaining two-thirds of the animals are serving as herd-mate contact controls. The two groups are being compared in order to ascertain the immediate as well as the long-run effects of such vaccine combinations in terms of vaccine safety, efficacy, duration of immunity and economic value. It has been shown that such a combination can be administered with the brucellosis procedure. This study is producing information in the field of vaccine development and evaluation, and should eventually lead to the formulation of a systematic plan for simultaneous vaccination of dairy cattle against many diseases.

Epidemiology of Bovine Virus Diarrhea

The virus of bovine virus diarrhea can be isolated readily from typical clinical cases of this disease. About 50% of adult cattle in New York State possess specific antibodies against this virus, thus indicating past infection with this virus, although most of these immune animals have no history of the clinical disease. Field studies are underway which will provide information regarding the age distribution and duration of this immunity. Passive transfer of this immunity through colostrum to calves, eventual disappearance of colostral protection, and its effect on the minimum age at which active immunization through vaccination can be carried out are all under study by serological procedures.

Epidemiology of Bovine Winter Dysentery

Attempts have been made, using embryonated hens' eggs and tissue cultures, to recover an infectious agent from blood and feces of animals affected with Epidemic Bovine Winter Dysentery. No agent has yet been isolated. In transmission experiments, one of three calves which were exposed by oral inoculation of feces developed diarrhea. The animal was autopsied and no significant gross lesions were seen, nor was an infectious agent recovered from its tissues. Transmission was not accomplished in five adult Guernsey cattle of unkown susceptibility when they were inoculated intravenously and intranasally with tissue cultured blood from cases of acute winter dysentery. It has been shown serologically that no relationship exists between so-called winter dysentery and the viruses of infectious bovine rhinotracheitis and bovine virus diarrhea. Vaccine studies indicate that bovine virus diarrhea vaccine and infectious bovine rhinotracheitis vaccine should not be expected to protect cattle against winter dysentery.

Infectious Bovine Rhinotracheitis in New York Dairy Cattle

The respiratory form of infectious bovine rhinotracheitis (IBR) has been positively diagnosed by serological means and by virus isolation in dairy herds in widely diverse areas of New York State. IBR virus was recovered from nasal discharges on animals with upper respiratory involvement and from vaginal swabs from a case of infectious pustular vulvovaginitis which occurred simultaneously in different animals in the same herd. The IBR virus was also isolated from the placenta of a cow which aborted following this herd epidemic. Selected animals in IBR infected herds have been studied to determine the duration of immunity following natural infection with IBR virus. Twelve to seventeen months after infection all animals still have antibodies (and are thus presumably immune). These animals will be sampled periodically until immunity disappears. This information has value in the determination of vaccination schedules, in interpretation of serological data, and in providing clues to the nature of the virus and the nature of the disease.

Cowpox

The true cowpox virus is being grown on egg membranes and will be used to determine if this virus is present in the New York cattle population, and to what extent. This work is continuing.

Mycoplasma Mastitis

With the cooperation of veterinarians associated with the New York State mastitis control program, surveillance of New York dairy herds for mycoplasma mastitis has continued throughout the year. Experimental studies of the pathogenesis and natural habitat of the principal mycoplasma type responsible for New York herd outbreaks are being carried out.

The following practicing veterinarians in Central New York (and their cooperating dairy herd owners) have rendered valuable assistance in the conduct of these cattle field experiments and vaccination tests:

Dr. Roger Batchelder
Dr. LaVerne Dann
Dr. William Hume
Dr. John Jackson
Dr. John Murray
Dr. John McAuliff
Dr. Webster Phillips

SWINE

Nutritional Factors Affecting Antibody Production

The successful control of any disease through vaccination is dependent not only upon the proper use of a good biological product but upon the ability of the vaccinated animals to produce antibodies against the antigens used. It has been postulated that nutritional requirements for growth are lower than those required for antibody production. Studies with dogs have shown that the pantothenic acid

requirement for high antibody production is indeed greater than that needed for good growth. These studies are being extended to include other nutrients and other species of animals; farm animals, particularly.

Studies on Means of Eradication of Hog Cholera

The discovery of a cytopathic strain of hog cholera virus at this laboratory and the subsequent developement of a standardized serum neutralization test have made possible accurate measurements of hog cholera antibodies. This test enables workers to follow the progress of present or contemplated methods of hog cholera eradication.

Our laboratory has shown that pigs can be protected against virulent hog cholera virus by the inoculation of bovine virus diarrhea (BVD) virus. The phenomenon of secondary response has been shown to be the nature of this protection. Our studies have disclosed that pigs were protected against all of many strains tested of hog cholera naturally occurring in the field. It is a safe vaccine in that it cannot cause hog cholera in pigs and does not spread from pig to pig or to susceptible cattle kept in close contact. The maternal hog cholera antibody present in the milk of sows does not interfere with its efficacy. We recommend that BVD virus vaccine be tried in a hog cholera eradication program.

CONTRIBUTIONS

FOR DAIRY AND LIVESTOCK PROGRAMS

July 1, to June 30

Contributors	1961-62		1962-63		1963-64	
	Number	Amount	Number	Amount	Number	Amount
Farm Cooperatives	47	$11,120	72	$12,400	70	$11,855
Agricultural Business	18	1,600	18	2,285	19	2,245
Cattle Dealers & Markets	8	140	13	270	11	200
Banks, N.Y. State	4	70	8	180	21	745
Individuals	1	25	22	315	157	2,495
TOTALS	78	$12,955	133	$15,450	278	$17,540

FARM LIVESTOCK RESEARCH BUDGET

1964 - 1965

Expenditures

Salaries	
Two laboratory technicians	$ 9,000
Stenographer (part-time)	1,500
Veterinary field service fees	2,000
Statistician and Consultant	4,000
Laboratory Operation	
Supplies, including feeds for test animals	1,500
Vaccines (some are donated)	500
Test animals: purchased and raised	900
Postage, printing, supplies	200
Travel	
Field service	800
Scientific meeting attendance	200
Total budget - 1964-65	$20,600

Additional funds exceeding $20,000, will be provided by Cornell University from other sources for building, laboratory equipment, maintenance and other overhead costs.

CONTRIBUTORS TO

CORNELL'S VETERINARY VIRUS RESEARCH INSTITUTE

FARM ANIMAL RESEARCH FUND

1963 - 1964

FARM COOPERATIVES

Agway, Inc
Boonville Farms Cooperative, Inc.
Dairymens League Cooperative Association, Inc.
Eastern Milk Producers Cooperative Association, Inc.
and the following Locals:

Copenhagen	New Berlin
Fort Plain	New Haven (Vt.)
Frasers	North Chatham
Grand Gorge	Roxbury
Little Falls	Walton

4-H Boots and Saddle Club, Bombay, New York
Genesee Valley Cooperatives, Inc.
Lisle Producers Cooperatives, Inc.
Metropolitan Cooperative Milk Producers
Bargaining Agency, Inc. and member
cooperatives as follows:

Adams Center	Martville
And-Well	Middlebury, (Pa.)
Burke	Montgomery
Campbell	Mount Joy (Pa.)
Canisteo	North Country
Canton	Ogdensburg
Cape Vincent	Oswegatchie
Central New York	Otselic Valley
Champlain	Owasco
Chautauqua-Maid	Pierrepont Manor
East Freetown	Port Allegany, (Pa.)
Fair Haven, (VT.)	Potsdam
Finger Lakes	Preble
Fort Edward	Roseville, (Pa.)
Galeton, (Pa.)	Sherburne
Georgetown - Sheds	Slate Hill
Gouveneur	South Dayton
Gracie	South Montrose, (Pa.)
Keuka	Steamburg
Konhokton	Sugar Grove, (Pa.)
Leon	Tioga Valley, (Pa.)
Lisbon	Towanda Valley, (Pa.)
Malone	Watertown
Marshall	West Burlington, (Pa.)

Monticello Riding Club
Mutual Federation of Independent Cooperatives, Inc.
and member cooperatives.

Niagara Frontier Cooperative Milk Producers
Bargaining Agency, Inc. and member
cooperatives as follows:
Arcade Farms Cooperative, Inc.
Aurora Independent Milk Producers Cooperative, Inc.
Collins Producers Cooperative, Inc.
Erie County Milk Producers Cooperative, Inc.
Frontier Federated Cooperatives, Inc.
Hollisville Milk Producers Cooperatives, Inc.
Niagara County Milk Producers cooperative, Inc.
United Guernsey Milk Producers Cooperative, Inc.
New York Hereford Association
New York Holstein Friesian Association
New York State Guernsey Breeders Cooperative, Inc.

CATTLE DEALERS and AUCTION MARKETS

M. Barmann and Sons
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Buckenmeyer Brothers
Burton's Livestock Exchange, Inc.
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Ring and Stern, Inc.
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AGRICULTURAL BUSINESSES

Arkport Dairies, Inc.
Beatrice Foods Company
Breyer Ice Cream Division
Cavalier Gage Company
Conti Packing Company
Cooperdale Dairy Inc.
Davenport Center Dairy, Inc.
DeWitt Packing Company
Fitchett Brothers, Inc.
Foremost Research Foundation
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Hershey Chocolate Corporation
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Nadler Brothers, Inc.
North Blenheim Creamery Co.
Pine Grove Dairy, Inc.
Prattsburg Creamery Company
Queens Farms Dairy Company
M. H. Renken Dairy Company
Sealtest Foods Div., Schenectady
Tobin Packing Company

NEW YORK STATE BANKS

Bank of Avoca	Avoca
Bank of LeRoy	LeRoy
Chautauqua National Bank	Cherry Creek
Citizens Central Bank	Arcade
and branches at Delevan, Rushford and Silver Springs	
Citizens National Bank	Wellsville
County National Bank	Pine Bush
First National Bank	Callicoon
First National Bank	Hamden
First National Bank	Interlaken
First National Bank	Jeffersonville
First National Bank	Moravia
Homer National Bank	Homer
Lewis County Trust Company	Lowville
Little Falls National Bank	Little Falls
Lyons National Bank	Lyons
Marine Midland Trust Company	Rochester
Montour National Bank	Montour Falls
National Bank of Delaware County	Walton
and branches at Andes and Franklin	
National Bank of Florida	Florida
National Bank of Vernon	Vernon
National Bank of Waterville	Waterville
National Bank and Trust Company	Norwich
and branches at Afton, Bainbridge, Earlville, Grand Gorge, Margaretville, New Berlin, Sherburne and South Otselic	
Ogdensburg Trust Company	Ogdensburg
State Bank of Albany	Fort Plain
State Bank of Chittenango	Chittenango
Valley National Bank	Wallkill

INDIVIDUAL CONTRIBUTORS

(Livestock Owners, Veterinarians and Friends of Cornell)

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Robert E. Lynk, DVM

Allegany:
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Chanango:
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Clinton:
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Kuppens Bros.
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Black Watch Farm
Briarcliff Farm, Inc.
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Oneida Cont'd:
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Earle R. Williams

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Henry Faryna
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Other States:
Mrs. George Miner, Connecticut

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